

Joan Muñoz Biosca



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ABOUT ME

I am a highly resilient and responsible person who takes responsibility for tasks and completes them with proper organisation. With a proven track record of adapting to and overcoming tough challenges, I am able to handle complex problems with ease. My excellent capacity for comprehension and communication enables me to foster a collaborative teamwork atmosphere, consistently combined with constant improvement in my work methods. Drawing on my strong computational background and scientific knowledge of physics and biosciences, I am skilled at efficiently collecting and analysing research data. In my various professional roles, I have predominantly employed Python and C++. However, I have undertaken self-learning in a range of Python-based frameworks and libraries, including Django and SQL. Passionate about the world of technology and innovation, I am always eager to expand my skill set and learn new programming languages to enhance my career.

EDUCATION

- 2021 – 2022 **Master in Nanoscience and Nanotechnology**
University of Barcelona (UB), Spain
- 2017 – 2021 **Bachelor's degree in Physics**
University of Barcelona (UB), Spain
- 2013 – 2017 **Bachelor's degree in Mathematics**
Polytechnic University of Catalonia (UPC), Spain
- 2011 – 2013 **Scientific A levels**
FINISHED WITH HONORS
High-performance sports centre of Amposta, Spain

WORK EXPERIENCE

FROM OCTOBER 2022 TO JUNE 2023

KU Leuven

PhD in Bio-science Engineering

This project is split up into two differentiated parts and another one focused on education tasks:

Computational research:

Developing and implementing a novel computational model that couples a continuum description of the cell's extracellular matrix and the cell deformation during tissue differentiation. This fluid-structure interaction is carried out with Mpacts (Python based) for the cell and OpenFOAM (C++ based) for the fluid phase. On the other hand, I was responsible for generating media results for the research group in Paraview.

Experimental research:

Designing and performing In vitro experiments to calculate viscoelastic properties of bone tissue samples. Leveraging the expertise I acquired with some microscopy techniques, such as Atomic Force Microscope, I extracted valuable information from experiments which will be used to tune up biomedical applications for bone regeneration.

Mentoring activities:

Responsible for Mentoring MSc students in their Master's thesis and supervising and guiding bachelor students for the course "Project Work Biosystems Engineering" (Bioscience Engineering Faculty).

FROM SEP 2021 TO JUL 2022

Rheo Diagnostic S.L *Research Assistant*

In addition to maintaining the previous responsibilities, I was also tasked with presenting the significant advances at various conferences (see Conferences section). This project was fully developed in Python language and was part of my master thesis, which was awarded a 99% grade and will be applied in a novel lab-on-a-chip platform. Additionally, I am currently formalising my work to be submitted as a journal article.

FROM FEB 2021 TO AUGUST 2021

Rheo Diagnostic S.L *Research Internship*

The work that I conducted in Rheo Diagnostics (RheoDx), which is a company aimed at improving the quality of life of haematology patients, was entirely computational (Python) and consisted of studying how to couple a phase-field model with an incompressible fluid to study red blood cell rheological behaviour. Once the theory was implemented, one important task was also generate the media to present relevant 3D results. This project was part of my bachelor thesis, which was awarded a 96%.

SKILLS

BEGINNER	SQL, Django, CSS, PHP, JavaScript, Traction Force Microscopy, Inkscape
INTERMEDIATE	HTML, Matlab, Matplotlib, C++, Linux, OpenFOAM, Atomic Force Microscopy, Git, Gitlab, HPC
EXPERT	Python, Paraview, L ^A T _E X

LANGUAGES

CATALAN	Native
SPANISH	Native
ENGLISH	Fluid

CONFERENCES

Physics of Life Summer School 2022 (Edinburgh)

Participation with poster: *Modelling membranes in a flow with a stream function formulation*. Andreu F. Gallen, Joan M. Biosca, and Aurora Hernandez-Machado.

XXIII Conference on statistical physics: FisEs 2022 (Zaragoza)

Participation with poster: *Modelling membranes in a flow with a stream function formulation*. Andreu F. Gallen, Joan M. Biosca, and Aurora Hernandez-Machado.

PUBLICATIONS

Joan M. Biosca, Andreu F. Gallen, & Aurora Hernandez-Machado. RBC in flow: Role of shape and rigidity through 3D Vector Potential. *In preparation.*